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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/527,526	03/11/2005	Junichi Seki	03500.017685	7445
5514	7590	12/14/2005	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			DUPUIS, DEREK L	
			ART UNIT	PAPER NUMBER
			2883	

DATE MAILED: 12/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

**Office Action Summary**

Application No.

10/527,526

Applicant(s)

SEKI ET AL.

Examiner

Derek L. Dupuis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/11/2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

2. The information disclosure statement (IDS) submitted on 3/11/2005 is being considered by the examiner.

### ***Drawings***

3. The drawings were received on 3/11/2005. These drawings are accepted by the examiner.

### ***Specification***

4. The disclosure is objected to because of the following informalities: in line 11 of page 7, the reference number "103" should apparently be "108".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 2-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claims 2-5 recites the limitation "said cyclic structure" or "the cyclic structure" in line 7 of claim 2, line 6 of claim 3, and line 5 of claim 4. There is insufficient antecedent basis for this

limitation in the claim. Claim 5 is rejected because it depends from claim 4. For the purpose of examination, the examiner has interpreted this limitation to be "a cyclic structure" in claims 2 and 3. This would give the limitation present in claim 4 proper antecedent basis.

8. Claim 6 recites the limitation "the end facet" in line 2. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 2, and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by *Cotteverte et al (US 2002/0048422 A1)*.

11. Regarding claim 1, Cotteverte et al discloses an optical deflector as shown in figures 14-19. Cotteverte et al teach a photonic crystal section (102), a light lead-in means (154) for leading light to the photonic crystal section (102) and an external force application means (120 and 122 in figure 16 and 124, 126, and 134 in figure 17). The external force application means deforms the photonic crystal section (102) by way of mechanical external force and changing the angle of refraction of the light led in by the light lead-in section (see paragraphs 58-61, 63, 64, 66, and 67).

12. Regarding claim 2, Cotteverte et al teach an optical deflector as discussed above in reference to claim 1. As taught by Cotteverte et al, the photonic crystal section is formed by a member deformable by external force. The external force application means is adapted to apply

mechanical external force to the photonic crystal section in the direction of cyclicity of the cyclic structure of the photonic crystal section so as to shift the angle of refraction in the photonic crystal structure (see paragraphs 58-61, 63, 64, 66, and 67). Furthermore, it has been held that the recitation that an element is “adapted to” perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.

13. Regarding claim 7, Cotteverte et al teach an optical deflector as discussed above in reference to claim 1. The device also includes a light lead-out means (150 and 172) for leading out light deflected to a desired direction by the optical deflector.

14. Regarding claim 8, Cotteverte et al teach an optical deflector as discussed above in reference to claim 1. The preamble of the claim “an optical scanner” has not been given patentable weight because it has been held that a preamble is denied the effect of a limitation where the claim is drawn to a structure and the portion of the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951). Furthermore, the use as a scanner is an intended use and is not given weight since it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, USPQ2d 1647 (1987).

15. Regarding claim 9, Cotteverte et al teach an optical deflection method as shown in figures 14-19. The method is characterized by leading in light having a specific wavelength to a photonic crystal section as shown in figures 18 and 19. The angle of refraction of the light is

shifted in the photonic crystal section by applying a mechanical external force to said photonic crystal section thereby deflecting the light (see paragraphs 58-61, 63, 64, 66, and 67).

***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Cotteverte et al (US 2002/0048422 A1)* as applied to claims 1, 2, and 7-9 above, and further in view of *Matsuura et al (WO 02/10843 A2)*.

18. Regarding claims 3-5, Cotteverte et al teach an optical deflector as discussed above in reference to claim 1. Cotteverte et al teach that photonic crystal section is formed by using deformable pillar-shaped independent members for forming a cyclic structure. A pair of support members (104 and 106) sandwich the independent members (14) in a direction perpendicular to the direction of arrangement of the independent members (see paragraphs 58-61, 63, 64, 66, and 67). The upper cladding and lower cladding support members (104 and 106) have a refractive index that the different from that of the photonic crystal section so as to confine light to the crystal section. The upper and lower claddings (104 and 106) are considered to be “substrates” and the face of the claddings that interfaces with the photonic crystal section is a reflection layer that confines the light to the photonic crystal section (see paragraph 61).

19. Cotteverte et al do not explicitly teach that the external force application means is adapted to apply a mechanical external force to the photonic crystal in a direction perpendicular

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to the direction of cyclicity of the cyclic structure of the crystal section so as to shift the angle of refraction in the crystal section.

20. Matsuura et al teach that a mechanical force can be exerted on a photonic crystal structure in a direction perpendicular to the direction of cyclicity of the cyclic structure as shown in figure 1 of Matsuura et al.

21. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the invention of Cotteverte et al to have the actuator apply a force in a direction perpendicular to the cyclic structure as taught by Matsuura et al. Motivation to do this would be the suggestion by Cotteverte et al to deflect a light signal by “dynamically changing the dimensions of the structure of the photonic crystal”. While Cotteverte et al only explicitly teach altering the width or length of the crystal, it would be within the level of one of ordinary skill in the art to modify the third dimension of thickness to achieve the same result. Further motivation is that Matsuura et al solves the same problem as Cotteverte et al. Both Cotteverte et al and Matsuura et al are attempting to change the physical dimensions of the photonic crystal.

Furthermore, Matsuura teaches that the method of changing the thickness leads “directly to changes in the optical properties of the photonic device” (see page 12) Cotteverte et al seek to achieve these same changes in the optical properties, namely a change in the refractive index.

22. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Cotteverte et al* (US 2002/0048422 A1) as applied to claims 1, 2, and 7-9 above, and further in view of *Vargaftman et al* (US 2003/0231689 A1).

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23. Regarding claim 6, Cotteverte et al teach an optical deflector as discussed above in reference to claim 1. Cotteverte et al teach an output facet for the light signal. However, Cotteverte et al do not explicitly teach that the output faced has an arc-shaped profile.

24. Vargaftman et al teach a photonic crystal light emitting device with a curved end output facet as shown in figure 5.

25. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the deflector taught by Cotteverte et al by using an arc-shaped output facet as taught by Vargaftman et al. Motivation to do this would be that a curved output face can be used to recognize beam steering capabilities. Furthermore, a single output can be used to deflect light to multiple locations rather than using multiple outputs (see paragraphs 97 and 98 of Vargaftman et al.).

### ***Double Patenting***

26. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.



Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

27. Claims 1, 2, and 7-9 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of copending Application No. 10/522,226. Although the conflicting claims are not identical, they are not patentably distinct from each other because the limitation of changing the angle of refraction is a result of changing the periodicity.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

28. Claims 1, 3-5, and 7-9 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of copending Application No. 10/524,831. Although the conflicting claims are not identical, they are not patentably distinct from each other because the limitation of changing the angle of refraction is a result of changing the periodicity.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Conclusion***

29. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

***Matsuura et al (WO 02/10843)*** could also be used as prior art under 35 U.S.C. 102(b) for at least claims 1, 3, and 9.

***Fukshima et al (US 2002/0135863 A1)*** teach the limitations of at least claims 1 and 9.

*Allan et al (US 2002/0021878 A1)* teach the limitations of at least claims 1 and 9.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek L. Dupuis whose telephone number is (571) 272-3101. The examiner can normally be reached on Monday - Friday 8:30am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Derek L. Dupuis  
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**KAVEH KIANNI  
PRIMARY EXAMINER**

